Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

have to be very strong. We cannot help but feel that while the observations recorded in these "studies" are of great interest, some of the conclusions are entirely too sweeping. The occurrence of centrosomes in the higher plants is far from settled, and the occurrence of a multipolar phase as necessarily antecedent to the bipolar phase of a spindle may be regarded as still an open question.

The result of these "studies" will be to stimulate investigation greatly rather than to command immediate belief in the more important conclusions, and investigation is always more important than belief.—J. M. C.

## MINOR NOTICES.

T. D. A. COCKERELL[4] has published a remarkably full list of the food plants of scale insects. The preparation of the summary has emphasized two facts, viz., "the unexpected number of coccids found on many of the cultivated trees and shrubs, and the frequency with which species dangerous to fruit trees will occur on ornamental plants, which may be carried from place to place and be the means of disseminating the scales."—J. M. C.

THE FOURTH PART of *Flora Franciscana*[5] has just appeared, and is devoted to the Compositæ. As Professor Greene has been much concerned with various sections of this great group, it is of great interest to have the results of his studies brought together, so far as they can be within the limited range of this work. Space forbids mention of the numerous shiftings of generic boundaries and the new species described. Many of the author's views of the genera of Compositæ have been published already, but the contribution before us contains much new material. The richness of the Californian flora may be judged by the fact that the portion of it represented in this *Flora* contains 113 genera of Compositæ, and 492 species. The general character of the composite flora may be judged from the following summary of the number of species under each of the ten groups called "sub-orders," and named as follows: Eupatoriaceæ 9, Asteraceæ 149, Gnaphaliaceæ 30, Ambrosiaceæ 7, Helianthaceæ 29, Madiaceæ 79, Helenioideæ 76, Anthemideæ 25, Senecionideæ 59, Cynarocephalæ 29.—J. M. C.

## NOTES FOR STUDENTS.

ITEMS OF TAXONOMIC INTEREST are as follows: Karl M. Wiegand[6] has been studying *Galium trifidum* and its North American allies, and finds that this reputed "variable species" is a plexus of forms. He has used the form of the seed in cross-section as an important diagnostic character, and has been able to separate forms heretofore thrown together. The original *G. trifidum* L. seems to be Gray's var. *pusillum*, and other forms which have been loosely associated with it are here set apart as *G. arcuatum*, n. sp., *G. tinctorium* L. with three new varieties, two new varieties of *G. trifidum*, *G. cymosum*, n. sp., and *G. palustre* L. Charles L. Pollard[7] has described two new violets, *V. Porteriana* from Pennsylvania, and *V. flavovirens* from Idaho. The same author[8] also establishes *Oxytria* Raf. as the oldest generic name for the three species commonly described under Schoenolirion. Gust. O. A.: N. Malme has recently contributed to our knowledge of South American plants by the publication of three papers based upon his own collections. The first treats of the Xyridaceæ,[9] including descriptions of four new species of Xyris and one of Abolboda. The second treats of the genus Burmannia[10] two new species being described. The third discusses the Polygalaceæ.[11] In all of them it is important to note that the groups are presented in their biological aspects.—J. M. C.

---

[4] Proc. U. S. Nat. Mus. **19**: 725–785. 1897.

[5] GREENE, EDWARD L.—Flora Franciscana. An attempt to classify and describe the vascular plants of middle California. Part IV. Pp. 353–480. San Francisco: Payot, Upham & Co. London: William Wesley & Son. 1897. $1.00

[6] Bull. Torr. Bot. Club **24**: 389–403. 1897.

MISS ETHEL SARGANT'S second paper[12] on the formation of sexual nuclei in *Lilium Martagon* treats of spermatogenesis. It will be remembered that in the first paper on oogenesis the conclusion was reached that in no one of the three nuclear divisions which immediately precede the formation of the ovum is there a transverse fission of the chromosomes. Dr. Haecker's hypothesis demands that in one of these three divisions there must be a transverse fission of chromosomes, and also a transverse fission in one of the four divisions which lead to the formation of the male pronucleus.

The nuclei of the pollen mother cells pass through a period of development which corresponds in every detail to that of the macrospore nucleus. The amorphous chromatin which was described in the first paper appears again in the pollen mother cells. The synapsis stage is discussed at some length, and the conclusion is reached that synapsis is a normal phenomenon and not an artefact due to reagents. The conclusion is based mainly upon a study of living material. Three features characterize synapsis: "a more or less complete disappearance of the nuclear membrane, partial solution of the nucleolus, and contraction of the chromatin thread." In late synapsis the nuclear membrane begins to reappear, nucleoli are reconstructed from an amorphous nucleolar mass, the chromatin threads become looser, and the

---

[7] Op. cit. **24**: 404–405. 1897.

[8] Op. cit. **24**: 405–407. 1897.

[9] Bihang till Kongl. Svenska Vet.-Akad. Handl. **22**: [no. 2]. 1896.

[10] Op. cit. **22**: [no. 8]. 1896.

[11] Öfversigt af Kongl. Vet.-Akad. Förhandl. no. 4. 1897.

[12] The formation of the sexual nuclei in *Lilium Martagon*: II Spermatogenesis. Ann. Bot. **11**: 187–224. 1897.

familiar spirem stage is reached. The nucleus is smaller than the embryo sac nucleus of the same stage, but the ribbons have about the same width in both. "It seems probable that the linin matrix of the ribbon is formed in great part from the substance of the half dissolved nucleolus." The double row of chromatin granules is first demonstrated with certainty during the synapsis stage, but Miss Sargant believes that it occurs earlier. As in the embryo sac nucleus, longitudinal splitting of the spirem ribbon precedes the division into the segments which constitute the chromosomes. Each of these chromosomes thus consists of two distinct longitudinal segments which separate during karyokinesis. Each of these segments shows a double row of chromatin granules, thus suggesting a fourfold character of the chromosome and recalling the tetrad of the animal spermatocyte, which in Ascaris results from a double longitudinal fission. A second fission could not be demonstrated either in the embryo sac or pollen mother cell of Lilium. Spindle fibers appear from two or three points in the cytoplasm, forming a spindle which is rarely symmetrical at first. Attached to each chromosome are two bundles of fibers which seem to pull the chromosomes toward the poles. The daughter chromosomes in the diaster stage are commonly V-shaped.

The number of chromosomes was twelve in all cases in which they could be counted with certainty. There is a suggestion that the daughter chromosomes of the first division retain their identity within the daughter nucleus.

The nucleus of the pollen grain divides once before the grain is shed, and the daughter chromosomes separate exactly as in the vegetative nucleus. No centrosomes were observed, but there was often a differentiated mass of cytoplasm from which radiations could be traced into the surrounding cytoplasm. The generative nucleus, which divides soon after the formation of the pollen tube, shows a definite longitudinal splitting of the chromosomes. The generative nuclei are exactly alike and neither possesses a nuclear membrane or a nucleolus. In the three later divisions the number of chromosomes could not be counted with certainty, but there were about twelve.

In both spermatogenesis and oogensis the parent chromosome gives rise to daughter chromosomes by longitudinal fission. The seven divisions of these series are all distinguished by having twelve chromosomes instead of twenty-four. Of these seven divisions the first of each series differs decidedly from the rest, which are distinguished from the vegetative type only by the reduced number of chromosomes. The name "homotype," already in use by zoologists, has been given to the five divisions which follow the vegetative type, while the term "heterotype" is applied to the first division in each series. In the spirem stage of the homotype division the ribbon stains uniformly, while in the corresponding stage of the heterotype the ribbon is bordered by a double row of cyanophilous granules. In the homotype division the chromosomes are formed of lengths of the spirem ribbon, the longitudinal fission of the chromosomes appearing later, while in the heterotype longitudinal fission of the whole ribbon precedes the segmentation into chromosomes. Segments of homotype chromosomes appear homogeneous during karyokinesis, while those of the heterotype show a row of granules on each margin. The segments of homotype chromosomes are nearly parallel and quite regular, while those of the heterotype are twisted and contorted in the nuclear plate. Segments of the homotype diaster are usually hooked, while those of the heterotype diaster are V-shaped.—C. J. C.